REMARKS/ARGUMENTS

Claims 1-19 are currently pending in this application. Claims 1, 5, 9-10, 15 and 17 are currently amended. Claims 8 and 16 are cancelled. Claims 20-21 are added. No new matter has been added. Claims 1-7, 9-15 and 17-21 will be pending after entry of this amendment.

Amendments to the Drawings

The drawings were objected to under 37 C.F.R. § 1.83(a) as allegedly failing to show the "DC voltage generating means disposed within the microphone housing, operatively coupled to the clock signal, as claimed in claim 5." Office Action, Page 2. Replacement drawing sheet 3 addresses this drawing objection. FIG. 3 has been amended to show an optional DC voltage generating means 90 disposed within the microphone housing and coupled to the external clock signal 27. No new matter has been added.

Accordingly, Applicants submit that the replacement drawing overcomes the objections and favorable action is requested.

Amendments to the Specification

In the Specification, paragraph [0040] has been amended to reflect the amendments made to the drawings. Support for this amendment can be found in at least paragraph [0020] and in claim 5 of the originally filed application. Thus, no new matter is added.

Claim Rejections – 35 USC § 112

Claim 5 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Office Action alleges that "it is unclear whether the DC voltage generating means is a component for deriving a DC voltage, or a voltage supply." Office Action, Page 3. In response, Applicants have amended claim 5 to recite "a DC voltage generating means for deriving a DC voltage supply." The Applicants respectfully request that the rejection of claim 5 be withdrawn.

Claim Rejections – 35 USC § 103

Claims 1-2 and 4-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Publication No. 2003/0223592 ("Deruginsky") in view of U.S. Patent No. 6,326,912

("Fujimori"). Applicant respectfully traverses these rejections and requests reconsideration thereof.

Independent Claim 1

Independent claim 1 has been amended to recite, *inter alia*, "the multi-level quantizer having at least three discrete quantization levels, each of the discrete quantization levels being represented by a set of corresponding symbols, each symbol comprises a number of one signs, the number of one signs being proportional with a magnitude of the transducer signal represented by the corresponding multi-bit sample." Support for this claim amendment is provided at, for example, paragraphs [0022] and [0039]-[0046] of the present application. These passages describe a multi-level quantizer that is not disclosed by either Fujimori or Deruginsky. The multi-level quantizer outputs unformatted multi-bit samples. The multi-bit samples are represented by a set of symbols, which are comprised of one signs and zero signs (i.e., 1s and 0s). The quantization level associated with a particular multi-bit sample is determined by the number of one signs in the multi-bit sample irrespective of the location or ordering of the one signs within the multi-bit sample.

An example of this novel coding of multi-bit samples is illustrated at paragraphs [0042]-[0046] for a multi-level quantizer having five quantization levels. The first quantization level, "Level -2", is represented by symbol {0000}, which has no one signs. The next quantization level, "Level -1", is represented by symbol {0001}, which has a single one sign. "Level 0" is represented by symbol {1010} having 2 one signs, "Level +1" is represented by symbol {1110} having 3 one signs, and "Level +2" is represented by symbol {1111} having 4 one signs. Importantly, it is the number of one signs within the symbol that defines the quantization level and thereby the magnitude of the analog transducer signal. Thus, in alternative examples of the disclosed multi-level quantizer, "Level -1" could be represented by any of the following symbols: {0001}, {0010}, {0100} or {1000}. Similarly, quantization level "Level 0" could be represented by any of the following symbols: {0011}, {0101}, {1001}, {0110}, {1010}, {1100}. Unlike the systems in the applied prior art, the location or order of the one signs within the symbols has no effect on the determination of the quantization level represented by the multi-bit sample.

Because each symbol is defined only by the number of one signs, a multi-level quantizer including N discrete quantization levels requires a minimum of N-1 bits to represent each of the N levels with a unique symbol. Present Application, paragraph [0022]. Therefore, the claimed multi-level quantizer requires a greater quantity of bits per multi-bit sample to represent the full set of symbols than in conventional multi-level quantizers such as, for example, those encoding in binary where N bits can represent 2^N quantization levels. The claimed multi-level quantizer is advantageous because the outputted multi-bit samples can be processed with "a minimum of logic circuitry and therefore [the claimed multi-level quantizer] represents a very attractive option for low-power and/or low cost applications like hearing instruments and mobile phones." Present Application, paragraph [0039].

The Office Action concedes that Derunginsky does not expressly disclose the multi-level quantizer claimed in independent claim 1. Office Action, Pages 4-5. Rather, the Office Action asserts that Fujimori discloses a multi-level quantizer to convert the transducer signal into multi-bit samples. Office Action, Pages 4-6. The Office Action attempts to combine Derunginsky with Fujimori to argue that it would have been obvious to modify Derunginsky in view of Fujimori to arrive at the claimed invention; however, the combination fails for at least the following reasons.

Fujimori fails to disclose, teach or suggest at least the multi-level quantizer claimed in independent claim 1. Rather, Fujimori only discloses a multi-level quantizer that outputs either a multi-bit delta-sigma format or a multi-bit PCM format. Fujimori, Col. 3, ll. 56-60; Col. 5, ll. 22-27; Col. 6, ll. 67 to Col. 7, ll. 2; Col. 3, ll. 31-50. Fujimori further teaches that "the intent . . . is to provide a *conditioned* multi-bit data stream conducive for modulator 18 and *for whatever digital system is coupled to the output of modulator* 18," such as a super audio CD unit. Fujimori, Col. 6, ll. 55-61 (emphasis added). Thus, Fujimori is directed to a multi-level quantizer for the purpose of outputting a *formatted* signal in one of several different digital audio formats. Fujimori, Col. 3, ll. 30-50. This expressed intent in Fujimori to output a *formatted* digital signal from the multi-level quantizer is directly contrary to the claimed multi-level quantizer, which outputs a multi-bit signal that has not been formatted according to any standard audio format. As such, Fujimori expressly teaches away from the claimed multi-level quantizer. Moreover, as explained above, the claimed multi-level quantizer outputs a multi-bit signal according to a novel coding that is not disclosed, taught or suggested by Fujimori. For at least

these reasons, claim 1 and claims 2-14, which depend therefrom, are believed to be allowable over Deruginsky in view of Fujimori.

The Office Action alleges that Fujimori teaches a multi-level quantizer generating multi-bit samples "represented by a set of corresponding symbols, wherein each symbol comprises a number of one signs which is proportional with a magnitude of the corresponding multi-bit sample (Col. 6, lines 3-5)." Office Action, Page 6. However, the cited passage relates to "a **one-bit** digital signal 14 presented in delta-sigma format" that is outputted by the **delta-sigma modulator** 18. Fujimori, Col. 6, ll. 1-5; Col. 4, 5-9; FIG. 1 (emphasis added). A one-bit signal is not a multi-bit sample, and the delta-sigma modulator 18 of Fujimori is not a multi-level quantizer. Thus, the cited passage of Fujimori fails to disclose, teach or suggest the claimed **multi-level quantizer** or even a **multi-bit sample**. For at least these additional reasons, claim 1 and claims 2-7 and 9-14, which depend therefrom, are believed to be allowable over Deruginsky in view of Fujimori.

Independent Claim 15

Independent claim 15 recites, *inter alia*, "the multi-level quantizer having at least three discrete quantization levels, each of the discrete quantization levels being represented by a set of corresponding symbols, each symbol comprises a number of one signs, the number of one signs being proportional with a magnitude of the transducer signal represented by the corresponding multi-bit sample." As discussed above with respect to independent claim 1, Fujimori fails to disclose, teach or suggest such features. For at least those reasons, claim 15 and claims 17-19, which depend therefrom, are believed to be allowable over Deruginsky in view of Fujimori.

Conclusion

It is the Applicant's belief that all of the pending claims are in condition for allowance and action towards that end is respectfully requested. If any matters may be resolved or clarified through a telephone interview, the Examiner is respectfully requested to contact the Applicant's undersigned attorney at the number shown. A Petition for One-Month Extension of Time is submitted concurrently herewith along with the associated fee. It is believed that no other fees are due; however, should any additional fees be required (except for payment of the issue fee), the Commissioner is authorized to deduct the fees from Nixon Peabody LLP Deposit Account No. 50-4181, Order No. 247161-000047USPX.

Respectfully submitted,

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